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United States Patent [19]

Lung et al.

[11] **Patent Number:** 5,533,175[45] **Date of Patent:** Jul. 2, 1996[54] **LOW COST PAGE PRINTER SYSTEM AND METHOD**[75] **Inventors:** James C. Y. Lung, Santa Clara, Calif.;
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Santa Clara, Calif.[21] **Appl. No.:** 205,718[22] **Filed:** Mar. 4, 1994[51] **Int. Cl.:** G06K 15/00[52] **U.S. Cl.:** 395/115; 395/114[58] **Field of Search** 395/115, 116,
395/114, 164, 165, 166; 358/404, 444,
261.1, 261.4; 400/61, 62, 70[56] **References Cited****U.S. PATENT DOCUMENTS**

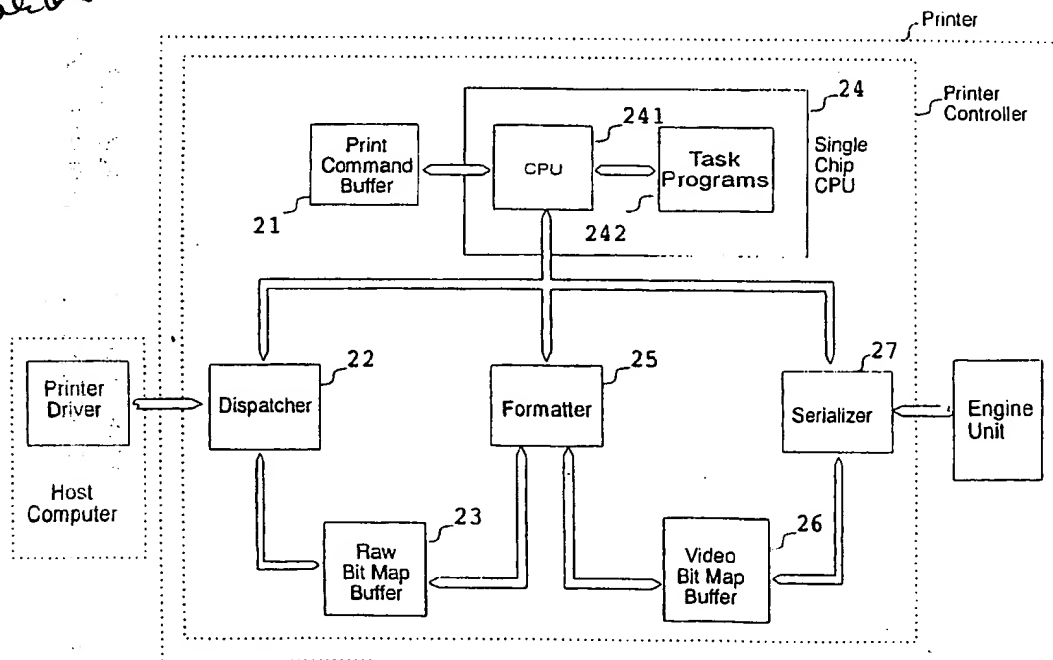
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Primary Examiner—Arthur G. Evans**Attorney, Agent, or Firm**—Claude A. S. Hamrick[57] **ABSTRACT**

A printer controller with a gate array capable of performing

image data reception, image data decompression and relocation, image data serialization to reduce the memory and CPU requirements. The controller cooperates with a host computer printer driver and utilizes the host computer to process data from application software into raw bit map data, compresses the raw bit map data, and encodes the raw bit map data for transmission to the printer controller.

The controller includes a dispatcher for keeping track of sequential print data received from the host computer and separating the print data into raw image data and print commands, a CPU which executes the print commands to instruct the printer to start or stop a printing job, report printer status to the host computer, manage printer configuration, etc., a raw bit map buffer for storing raw bit map data received from the dispatcher, a video bit map buffer, a formatter consisting of a decompressor that decompresses the raw bit map data into video bit map data, a relocater that puts the decompressed video bit map data into the video bit map buffer, and an arbiter that arbitrates between memory access requests from the host interface in the dispatcher, the decompressor, the serializer, the local CPU, and memory refresh logic, and a serializer which fetches video bit map data from the video bit map buffer, converts the data from parallel format into serial format, and outputs the video data in synchronization with the print engine unit.

30 Claims, 12 Drawing Sheets

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TITLE: Low cost page printer system and method

ABPL:

The controller includes a dispatcher for keeping track of sequential print data received from the host computer and separating the print data into raw image data and print commands, a CPU which executes the print commands to instruct the printer to start or stop a printing job, report printer status to the host computer, manage printer configuration, etc., a raw bit map buffer for storing raw bit map data received from the dispatcher, a video bit map buffer, a formatter consisting of a decompressor that decompresses the raw bit map data into video bit map data, a relocater that puts the decompressed video bit map data into the video bit map buffer, and an arbiter that arbitrates between memory access requests from the host interface in the dispatcher, the decompressor, the serializer, the local CPU, and memory refresh logic, and a serializer which fetches video bit map data from the video bit map buffer, converts the data from parallel format into serial format, and outputs the video data in synchronization with the print engine unit.

BSPR:

The controller includes a dispatcher for keeping track of sequential print data received from the host computer and separating the print data into raw image data and print commands, a central processing unit (CPU) which executes the print commands to instruct the printer to start or stop a printing job, report printer status to the host computer, manage printer configuration and other such house-keeping functions, a raw bit map buffer used for storing raw bit map data received from the dispatcher, a video bit map buffer which stores the video bit map data, a formatter consisting of a decompressor that decompresses the raw bit map data into video bit map data, a relocater that puts the decompressed video bit map data into the desired location in the video bit map buffer, and an arbiter that arbitrates between memory access requests from the host interface in the dispatcher, the decompressor, the serializer, the local CPU, and memory refresh logic, and a serializer which fetches video bit map data from the video bit map buffer, converts the data from parallel format into serial format, and outputs the video data in synchronization with the print engine unit.